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tic science was unique. His life was that of the recluse bachelor, and his later years brought anxiety and privation because his science had lost its value as a means of support. He will not soon be forgotten; but likewise no one will aspire to take his place.

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SCIENTIFIC BOOKS.

1. *Hygiene and Public Health.* By LOUIS PARKES, M.D., D.P.H., London University, and HENRY KENWOOD, M.B., D.P.H., F.O.S. Sixth edition, 1901. Philadelphia, Pa., P. Blakiston's Son & Co., publishers. With numerous illustrations. Pp. 732. Price, \$2.50.
2. *The Theory and Practice of Military Hygiene.* By EDWARD L. MUNSON, A.M., M.D., Captain, Medical Department, U. S. Army. First edition, 1901. New York, Wm. Wood & Company, publishers. Illustrated by eight plates and nearly four hundred engravings. Pp. 971. Price, extra muslin, \$8.00; leather, \$8.75.
3. *A Manual of Practical Hygiene*, for students, physicians and medical officers. By CHARLES HARRINGTON, M.D., Assistant Professor of Hygiene, Medical School of Harvard University. First edition, 1901. Philadelphia and New York, Lea Brothers & Co., publishers. Illustrated with twelve plates and one hundred and five engravings. Pp. 729. Cloth, \$4.25 net.
4. *The Principles of Hygiene*; a practical manual for students, physicians and health officers. By D. H. BERGEY, A.M., M.D., First Assistant, Laboratory of Hygiene, University of Pennsylvania. Philadelphia, W. B. Saunders & Co., publishers. Pp. 495. Price, cloth, \$3.00 net.
5. *School Hygiene.* By EDWARD R. SHAW, Professor of the Institute of Pedagogy, New York University. First edition, 1901. New York and London, The Macmillan Company, publishers. Pp. 260. Price, cloth, \$1.00.

In view of the fact that hygiene is not an independent science, but a correlation of the

teachings of physiology, chemistry, physics, meteorology, pathology, epidemiology, bacteriology and sociology, it is not surprising that the progress of this branch has been phenomenal. Over twenty text-books have been issued during the last ten years, and all but Parkes's in the above list are products of the present year. Indeed, this science was scarcely taught in any of our medical schools twenty years ago, and has received such an impetus during the past two decades that many regard it of modern origin. Such, however, is not the case, for on turning to early history, we almost invariably find that the health of the population has been made the subject of legislation. Hygiene was practiced by the Egyptians, the old Indians and Hebrews, and a study of the habits of the primitive peoples shows that a desire to prevent disease is innate to all men. The Greeks and Romans paid special attention to the physical culture of their youth, public water supplies and baths, and Athens and Rome were provided with sewers at an early period of their history. During the Middle Ages sanitation received a decided check; ignorance and brutal prejudices appear to have been the ruling spirits, and for many reasons it was the most unsanitary era in history. About this time most of the towns in Europe were built in a compact form, surrounded with walls; the streets were narrow and often winding for defensive purposes, shutting out light and air from the houses. The accumulation of filth was simply frightful. Stables and houses were close neighbors, human filth was thrown on the streets or manure heap. The dead were buried within the church-yards. Sewers and aqueducts having been permitted to fall into disuse, the inhabitants were compelled to resort to wells with polluted subsoil water. All the conditions were favorable for the spread of infectious diseases, and in the fourteenth century alone the oriental or bubonic plague, according to Hecker, carried off one-fourth of the population of Europe. The mortality in towns was greater than their birth rate, and the city population until the close of the eighteenth century had to be recruited continually from the country. The repeated invasion of pestilential diseases, however, compelled everywhere some sanitary efforts in the way of

widening streets for the purpose of supplying more air and light to habitations, better methods for the collection and removal of the wastes of human life, improvement in connection with infant and orphan asylums and in the management of schools and prisons.

The nineteenth century can boast of many advances in hygiene, particularly since the European invasion of cholera in 1830. English towns which had been visited by this disease, and those fearing similar scourges, freely instituted sanitary reform in the establishment of sewers, public water supply, sanitary homes for wage-earners, etc., but even during the Crimean War, the medical officers of the army evinced a shameful ignorance of the principles of sanitation and induced Edmund A. Parkes to write his manual of Practical Hygiene, and his teachings have borne ample fruit, especially in the improvement of the air we breathe and the water we drink. The question, has human suffering been mitigated and human life greatly prolonged by efforts in sanitation, can be emphatically answered in the affirmative. The average length of human life in the sixteenth century was only between 18 and 20 years; at the close of the eighteenth, it was a little over 30 years, while to-day it is over 40 years. Indeed, the span of life since 1880 has been lengthened about six years, as shown by statistics in Mulhall's Dictionary of Statistics (4th Edition, London, 1899). Mr. William A. King, Chief Statistician in the U. S. Census Office, informs the writer that from the results of the mortality returns for the twelfth census, for the States in which the returns were secured from registration records in both 1890 and 1900, there appears to be an absolute decrease in the general death rate of about 1.8 per 1,000 of population. This decrease seems to be most marked in the rate due to scarlet fever, whooping-cough, diphtheria and croup (combined), typhoid fever, malarial fever, consumption, diarrheal diseases and diseases of the nervous system, the decrease in the mortality in diphtheria and croup amounting to more than 50 per cent. On the other hand, the rate due to cancer and tumor (combined), Bright's disease, heart disease and dropsy (combined) and pneumonia is apparently greater than in 1890, the increase be-

ing most marked in the case of Bright's disease, cancer and tumor and pneumonia. The results in the decreased rate of diphtheria, croup, scarlet fever, typhoid fever, whooping cough, consumption, malarial fever and diarrheal diseases are the direct outcome of preventive medicine and are as gratifying as they are striking. We note with regret the increased rate in Bright's disease, heart disease, dropsy and pneumonia, and may well pause to inquire whether our ever-increasing annual 'national drink bill,' averaging 17.68 gallons per capita, may not be a factor in the development of these diseases, especially since there is reason to believe that the habitual and immoderate use of alcohol, apart from increasing the connective tissue and causing cirrhosis, also produces fatty degeneration, especially of the heart, liver and arterial coats, probably because it promotes the conversion of albuminoids into fats. Since our knowledge of the nature of infectious diseases has been more and more defined, scientific methods for their prevention have been applied. We have learned, too, that in addition to the germ there must be a suitable soil for its proliferation, and that sanitation will not only destroy the environments for its development without the body, but also place the system in the best possible condition to resist its toxic action. The application of this knowledge has saved millions of lives, besides an incalculable amount of human suffering and distress, not to mention the economic aspect of the question. When we remember all this and the fact that Jenner's discovery, at the close of last century, of a fundamental and practical method of producing artificial immunity has been far eclipsed in the last 20 years, and that we possess to-day not only curative but also protective sera for diphtheria, erysipelas, tetanus, plague and possibly cholera, tuberculosis, typhoid fever, pneumonia and a number of other immunizing agents for diseases of man and the lower animals, we have reason to believe that the solution of the problem of immunity is only a question of time and we may indeed expect great possibilities in our battle against infectious diseases. Great as our progress has been, much remains to be done. While every scientific physician familiar with biological research knows full well that if the

methods of prevention recommended by sanitarians, including the prompt disinfection of the dejecta of every typhoid fever patient, the expectoration and excretion of diphtheria and tuberculosis patients, for example, were adopted, these diseases would be reduced to a minimum and probably eradicated in the course of a few years. The facts are, these recommendations have not been generally adopted, because the knowledge gained by experimental medicine is not sufficiently diffused even among physicians. We hail, therefore, with special delight the appearance, in 1901, of five American text-books on this important subject. Dr. Louis Parkes's book is the sixth edition of a very popular text-book, in both England and America. It contains 12 chapters on water; the collection, removal and disposal of excretal and other refuse; air and ventilation; warming and lighting; soil and building sites; climate and meteorology; exercise and clothing; food, beverages and condiments; communicable diseases and their prevention; hospitals; disinfection; statistics; sanitary law and administration. The work is authoritative, and until the appearance of the American Text-books, by Rohé, Egbert and Coplin, enjoyed great popularity in our medical schools.

Dr. Munson's royal octavo volume of 948 pages is the best work in the English language on military hygiene. He has handled the subject in a masterly style. His literary skill, thoroughness and painstaking research, practical experience and expert knowledge of sanitary chemistry have combined to produce a treatise of rare merit. The work is divided into 27 chapters, and, in addition to the subjects treated of by Parkes and other authors in the general principles of hygiene, deals, of course, also with the selection and development of the recruit, the march in campaign, camp sites, the sanitary administration of the camp, post barracks and hospitals, diseases of the soldier, military mortality and morbidity, the habits of a soldier as affecting his efficiency, the hygiene of hot and cold climates, the hygiene of the troop-ship, etc.

Every chapter in the book is encyclopedic in character and contains a mine of the latest information of great value not only to the student of military hygiene, but to the general student

as well. So, for instance, the chapters on the selection and development of the recruit are of equal importance to those interested in personal hygiene and physical training. The chapter on water contains 150 pages, and is in many respects superior to the standard works exclusively devoted to the consideration of this important requisite. The chapter on the ration with his article on food in the hygiene of hot and cold climates covers over 160 pages and is practically a comprehensive treatise on food, dietaries, the preparation and preservation of food and its relation to health and disease. It contains facts not to be found in any other work.

The chapter on camp sites and the sanitary administration of camps is most admirably disposed of. Had the knowledge contained therein been more generally diffused among medical men and especially among the officers of the line, the disgraceful unsanitary scenes of our military camps during the recent Spanish-American war would not have been observed.

Chapter XV., on diseases of the soldier, is of extreme interest, especially the consideration of infective diseases, such as typhoid fever, which the author very properly considers as being the most important disease affecting soldiers. It is to be regretted that the lessons of the civil war and the note of warning sounded by Surgeon-General Sternberg at the outbreak of the Spanish-American war had made so little impression upon those entrusted with the care of our troops.

The chapter on excreta, sewage and refuse is very complete. The author's conclusion that typhoid cases are much more numerous in communities where fecal matters are collected in pits, pails, earth closets, etc., than among those provided with water-closets and sewers, was emphasized by the writer in his report on the prevalence of typhoid fever in the District of Columbia in 1895, and a probable explanation was offered by him in stating "these make-shifts, even if there were no wells, are still a source of danger in so far as they favor the transmission of germs by means of infected flies, nor can the possibility be ignored that the germs in leaky or overflowing boxes may reach the upper layer of the soil and with pulverized dust gain access to the system." It is a matter

of regret, therefore, that while 41 per cent. of our population live in towns having public water-supplies, only 28.7 per cent. are supplied with sewers, the neglect of which compels recourse to these makeshifts and leads to soil pollution and the evils referred to.

Space will not permit the presentation in detail of all the salient features of this excellent treatise. Our experience in the past shows the absolute necessity of sanitary training on the part of officers of the line. This work should be in the hands of every officer in the army and accessible to every enlisted man. We also venture to express the hope that a chair of hygiene will be created in connection with the military and naval academies. Such a step with men like Dr. Munson as professors would prove of incalculable value to the nation; indeed, the principles and practice of hygiene should be taught in every high school and college of the land, for nothing will contribute more to the sum total of human happiness than the preservation of health and eradication of preventable diseases.

Professor Harrington's manual is also complete, authoritative, practical and modern. It is divided into seventeen chapters, and we are pleased to note that a chapter on the 'Hygiene of Occupation' has been introduced and disposed of in a very satisfactory manner. The relations of occupation to health and life were studied as early as 1700 by Ramazzini, an Italian physician, and since then numerous monographs have appeared. We know to-day that persons habitually engaged in hard indoor work present a higher mortality than persons more favorably situated, and that the character of occupations influences to a great extent not only the average expectation of life, but also the prevalence of certain diseases. We know, for example, that tuberculosis is much more frequent among persons engaged in dust-inhaling occupations, and that the sharp angular particles of iron and stone dust are more liable to produce lesions of the respiratory mucosa than coal, flour, grain and tobacco dust. We know, too, that certain establishments are more or less productive of noxious and offensive gases, and that workers in lead, mercury, arsenic, phosphorus, poisonous dyes, etc., suffer especially from the injurious effects, and that other occu-

pations, such as mining, railroading and contact with moving machinery involve special danger to life and limb. For all these reasons the laboring classes need special protection, and in order to render this efficient, it must be provided by the enactment and enforcement of suitable laws. In 1864, 1867 and 1878, England enacted the so-called factory laws, while the first law as regards factory safety and sanitation in this country was enacted in Massachusetts in 1877, since which time 32 states have enacted similar laws. As a result of these laws, the majority of which were enacted during the past decade, commendable progress has been made in the way of ventilation, heating, lighting, removal of dust and injurious gases, means of escape in case of fire and prevention of injuries by moving machinery.

Dr. Harrington is quite right in saying: "It is often difficult or impossible, in the study of the effects of occupation, to eliminate outside influences which may affect the health of the worker as much or more than the circumstances of his trade. A hundred men, for example, from different strata of society, some married, others single; some living in comfortable houses, others in cheerless unsanitary tenements; some spending their evenings in wholesome recreation amid wholesome surroundings, others doing evening work in places of public entertainment and elsewhere, or spending their time and wages in the paths of vice; some naturally robust, and others inclined to disease, engage in the same occupation at the same time."

The writer has always felt that these and other factors, such as faulty nutrition, the result of badly prepared food and cold lunches, cannot fail to lower the power of resistance to disease, especially when the individual, in consequence of these very causes, has also become a victim of the alcohol habit, and has advocated the erection of sanitary homes for wage earners at reasonable rentals, the encouragement of cookery schools, the establishment of sanitary lodgings, model eating-houses and other betterments of industrial conditions. Dr. Harrington's book is well illustrated and will meet the needs of the student.

Dr. Bergey's book has just appeared and has been prepared, in the author's language, 'to

meet the needs of students of medicine in the acquirement of knowledge of those principles on which modern hygienic practices are based; to aid students in architecture in comprehending the sanitary requirements in ventilation, heating, water supply and sewage disposal, and to aid physicians and health officers in familiarizing themselves with the advances made in hygienic practices in recent years.' The volume, while not exhaustive, is accurate and will meet the demand in a very satisfactory manner. We regret, however, that neither this book nor Harrington's volume refers to the important subject of sexual hygiene and the prevention of venereal diseases, which affect not only the offender, but innocent wives, the offspring and not infrequently other innocent persons. According to Fournier, one-seventh of the population of Paris is syphilitic, and Morrow, from statistics gathered in New York, believes it is quite possible that Fournier's figures may apply to New York. Neisser holds that gonorrhœa is, with the exception of perhaps measles, the most widespread of all diseases. Other authorities have computed that 80 per cent. of all deaths from disease of the uterus and its annexes are of gonorrhœal origin, while according to Professor S. M. Burnett, of Georgetown University, 15,000 of the 50,000 blind persons in the United States lost their sight from blenorrhœa in the newborn, which, according to his calculation, involves a financial loss to the commonwealth of seven and one-half millions annually.

The measures which have been proposed for the control of the social evil and the prevention of its consequences are numerous enough, but not so easy of practical application. On the whole, it is believed that the remedy lies in public education. Public lecturers on the purity of man commit a serious mistake, however, when they picture the consequences of the social evil, without offering a suitable remedy. We should make a strong plea in favor of continence, and tell our young men that while the sexual passion is very strong, it can be accelerated or delayed, excited or lowered, by the influence of the will. We should assure them that by the cultivation of pure thought, removal of temptation, normal

mental and vigorous physical exercise, continence may not only become possible, but easy.

None of the books in the above list will fulfill a more important mission than the modest volume on School Hygiene, by Professor Edward R. Shaw, of the New York University. It is a timely book belonging to the Teachers' Professional Library series, and it is hoped it will enjoy a wide circulation, because, as the author very properly says, "The home may be educated to a great extent through the school. As the school, therefore, reacts closely upon the home, a knowledge of that which is hygienically best can in no other way be so quickly and thoroughly diffused."

The chapters treat of the school room, the school building, school grounds, warming and ventilation, sanitation, school baths, school furniture, posture and physical exercise, eyesight and hearing, handwriting, conditions conducive to healthful mental work, and diseases which concern the school. Every chapter is replete with information of great value and should be thoroughly absorbed by architects, school boards, teachers and parents. The book is accurate and reliable and the style clear and convincing.

During the year ending June 30, 1900, there were 15,341,220 children enrolled in the common schools of our country. When we consider that the mental and physical vigor of a nation depends largely on the environments of childhood and youth, it seems strange that up to within forty years little or no attention should have been paid to the hygiene of schools.

The author treats this important subject in a systematic and comprehensive manner, and no one can overestimate the practical results of his valuable teachings. Chapters IV. and V. are especially important, treating as they do of warming, ventilation, latrines, out-houses for country schools, plumbing, water supply, drinking-cups, daily cleaning of the school building, the cleaning of desks and seats, the disinfection of pencils and books, etc. Chapter VI., on school baths, should attract widespread attention, and shows what has been done in Europe, where the idea originated, and also in Boston, New York, and Chicago. According to the author, two distinct aims are held in view in the

provision which is made by school systems for bathing. The first aim is for physical exercise and health; when this is the aim a swimming tank is provided.* * * The second aim is to produce cleanliness and to teach cleanliness. The most satisfactory means to attain the second aim seems to be that of the shower-bath. In some schools a bath-tub is employed, but this cannot be used as economically in regard to time as the shower-bath; it must also be cleaned after each using. It will be understood, of course, that dressing rooms are necessary in connection with the baths. * * * The testimony of those who, under the conditions above mentioned, have instituted school baths is strong with reference to the physical and moral results arising therefrom. * * *

The writer is strongly in favor of swimming tanks in all high schools; such baths, after an ordinary cleansing shower bath, apart from bringing into play every muscle of the body, exert a general tonic effect and could be thrown open in the afternoons and evenings to adults, and thus subserve the purpose of public baths, of which there is a lamentable lack.

The chapter on eyesight and hearing is especially strong and suggestive of good results. The author, after referring to proper and sufficient lighting of the school room, points to the interesting investigations of Iaval, Cattell and Sanford, how vision may be impaired by texts printed in too small letters, the alterations needed in the forms of letters, the proper size of type for school books, color and surface of the paper for school books, the size of writing on the blackboard, the objection to the use of slates, color of writing ink, postures, use of fine maps, duty of parents in preventing children at home from reading excessively at night, or in the waning light, or sewing with black thread on black cloth with defective illumination.

The author's views on defective hearing are also extremely sound when he says, "if we are to educate children, it is supremely wise to know as many of their physical defects as possible, and especially is this true as regards defects of the two most important avenues of sense, the eye and the ear; for only by means of this knowledge can the teacher work intelligently and avoid unnecessary strain on the part

of the pupil and waste of effort on his own part. Careful investigations point to the broad fact that about 20 per cent. of school children possess some defect of hearing. It will be seen that the child of average ability who has some undetected defect of hearing will frequently be done an injustice and rated as dull or inattentive, not through any fault of his own, but because of a lack of knowledge on the part of the teacher of the true cause."

These abstracts sufficiently indicate the thoroughness which characterizes this most useful book.

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Manual of the Flora of the Northern States and Canada. By NATHANIEL LORD BRITTON, Ph.D., Director-in-Chief of the New York Botanical Garden; Emeritus Professor of Botany in Columbia University; Vice-President of the New York Academy of Sciences. New York, Henry Holt and Company. 1901. Duodecimo. Pp. x + 1080.

The appearance of a new manual of botany is an event of no small moment when it comes from the hand of one recognized as an authority in systematic botany. The 'Illustrated Flora of the Northern United States, Canada, and the British Possessions,' by Dr. Britton and Judge Brown, in 1896-7-8, marked an epoch in North American botany, and at once created an imperative demand for a handy field manual in the form of an abridgment of the large work. It is to meet this demand that the work before us is intended. In its preparation Dr. Britton has availed himself of the descriptions in the 'Illustrated Flora,' which are transcribed with little or no modification excepting the necessary one of changing English to metric measurements. Many species not described in the 'Illustrated Flora' are added, and not a few genera, bringing the total number of species to about 4,500 as against 4,162 in the original work. When we remember that the latest edition of Gray's 'Manual' contained descriptions of 3,298 species, and Coulter's 'Manual,' 1,881 species, it is evident that the utmost brevity has been imperative. Abbreviations are freely